UPDATE

Folic Acid Possibly A Key Factor In Alzheimer's Disease Prevention

Experiments with mice suggest that folic acid could play an essential role in protecting the brain against the ravages of Alzheimer's disease and other neurodegenerative disorders, according to scientists at the National Institute on Aging. This animal study could help researchers unravel the underlying biochemical mechanisms involved in another recent finding that concluded people with high blood levels of homocysteine have nearly twice the risk of developing the disease.

In the study, published in the March 1, 2002 issue of the *Journal of Neuroscience*, the investigators fed one group of mice with Alzheimer's-like plaques in their brains a diet that included normal amounts of folate, while a second group was fed a diet deficient in this vitamin. These mice are transgenic, meaning they were bred with mutant genes that cause AD in people. They develop AD-like plaques in their brains that kill neurons.

The NIA team counted neurons in the hippocampus, a brain region critical for learning and memory that is destroyed as plaques accumulate during Alzheimer's disease. The investigators found a decreased number of neurons in the mice fed the folic acid deficient diet.

The scientists also discovered that mice with low amounts of dietary folic acid had elevated levels of homocysteine, an amino acid, in the blood and brain. They suspect that increased levels of homocysteine in the brain caused damage to the DNA of nerve cells in the hippocampus. In transgenic mice fed an adequate amount of folate, nerve cells in this brain region were able to repair damage to their DNA. But in the transgenic mice fed a folate-deficient diet, nerve cells were unable to repair this DNA damage.

People who have Alzheimer's disease often have low levels of folic acid in their blood, but it is not clear whether this is a result of the disease or if they are simply malnourished due to their illness. But based on emerging research, Dr. Mattson speculates consuming adequate amounts of folic acid — either in the diet or by supplementation — could be beneficial to the aging brain and help protect it against Alzheimer's and other neurodegenerative diseases.

Green leafy vegetables, citrus fruits and juices, whole wheat bread and dry beans are good sources of the vitamin. Since 1998, the Food and Drug Administration has required the addition of folic acid to enriched breads, cereals, flours, corn meals, pastas, rice, and other grain products. However, because it can take a long time for the symptoms of Alzheimer's disease to surface, researchers speculate it will be many years before folate supplementation in food could affect the incidence of dementia in the United States. A human clinical trial is being planned.

Source: National Institutes of Health, 2002

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